



PUBLIC NOTICE
WILLIAMSBURG PLANNING COMMISSION

The Williamsburg Planning Commission will hold a public hearing on July 18, 2007, 3:30 P.M. in the Council Chambers of the Stryker Building, 412 North Boundary Street, to consider the following:

PCR #07-020: Amendment of the Zoning Ordinance by the addition of Article XII, Floodplain Regulations. These regulations comply with the requirements of the National Flood Insurance Program, and are necessary in order for property owners in the City to be eligible for the National Flood Insurance Program.

Additional information is available at www.williamsburgva.gov/dept/planning/agendas.htm; at the Planning Department [(757) 220-6130], 401 Lafayette Street; or at the Williamsburg Regional Library. Interested citizens are invited to attend this hearing and present their comments to the Commission.

If you are disabled and need accommodation in order to participate in the public hearing, please call the Planning Department at (757) 220-6130, (TTY) 220-6108, no later than 12:00 noon, Wednesday, July 11, 2007.

A handwritten signature in black ink that reads 'Reed T. Nester'.

Reed T. Nester
Planning Director



CITY OF WILLIAMSBURG

MEMORANDUM

TO: Planning Commission

DATE: June 14, 2007

SUBJECT: PCR #07-020
Addition of Article XII, Floodplain Regulations to the Zoning Ordinance

The attached regulations are necessary to meet the requirements of the National Flood Insurance Program. Previously the City's Chesapeake Bay regulations and map were used to comply with this program. We have been notified by the Federal Emergency Management Agency (FEMA) that the City's Chesapeake Bay regulations will no longer meet the requirement and floodplain regulations must be adopted by the City by September 28, 2007 for the City to be in compliance with the federal requirement.

The National Flood Insurance Program enables property owners in participating communities to purchase insurance protection against losses from flooding. This insurance is designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods. If the City does not adopt regulations, City residents will not have the opportunity to purchase flood insurance. The Federal Emergency Management Agency (FEMA) records indicate 46 policies for the City of Williamsburg for an insured value of \$11,668,700 with 13 losses in the City for a total of \$140,814.00.

We have also been notified that if the City does not participate in the program, the City will not be eligible for any federal funds for any future natural disasters, be they flood related or not.

PUBLIC HEARING DATE

The public hearing on this request is scheduled for the July 18th meeting.

Carolyn A. Murphy

Carolyn A. Murphy, AICP
Deputy Planning Director

ORDINANCE # 07-____
PROPOSED ORDINANCE #07-____

AN ORDINANCE
AMENDING CHAPTER 21, ZONING
OF THE CODE OF THE CITY OF WILLIAMSBURG
BY THE ADDITION OF ARTICLE XII,
FLOODPLAIN REGULATIONS
(PCR #07-020)

These revisions to Chapter 21, Zoning, of the Code of the City of Williamsburg are proposed to promote the health, safety and general welfare of the public; and to carry out the purpose and intent of Chapter 21 as stated in Sec. 21-1.

BE IT ORDAINED that Chapter 21, Zoning, of the Code of the City of Williamsburg, Virginia is hereby amended by the addition of Article XII, Floodplain Regulations:

ARTICLE XII. FLOODPLAIN REGULATIONS

Sec. 21-955. Statement of intent.

(a) These regulations are designed to prevent the loss of life and property, the creation of health and safety hazards, the disruption of commerce and governmental services, the extraordinary and unnecessary expenditure of public funds for flood protection and relief, and the impairment of the tax base by:

- (1) Regulating uses, activities and development which, alone or in combination with other existing or future uses, activities and development, will cause unacceptable increases in flood heights, velocities and frequencies.
- (2) Restricting or prohibiting certain uses, activities and development from locating within districts subject to flooding.
- (3) Requiring all those uses, activities and developments that do occur in flood-prone districts to be protected and/or floodproofed against flooding and flood damage.
- (4) Protecting individuals from buying land and structures which are unsuited for intended purposes because of flood hazards.

(b) These regulations comply with the requirements of the National Flood Insurance Program (Title 44, Chapter 1, Part 67, Code of Federal Regulations) administered by the Federal Emergency Management Agency and are necessary in order for all property owners within the City to be eligible for the National Flood Insurance Program and thereby purchase such insurance at nominal rates.

Sec. 21-956. Applicability.

(a) These provisions shall apply to all property designated as being located within the 100-year floodplain area by the Flood Insurance Study and as delineated on the Flood Insurance Rate Map (FIRM).

(b) The provisions shall supplement the regulations of the zoning district within which a subject property is located. The floodplain districts described herein shall be overlays to the existing zoning districts.

(c) When there is any conflict between the provisions or requirements of these regulations and those of the underlying zoning district, the more restrictive regulations shall apply.

(d) No land shall hereafter be developed and no structure shall be located, relocated, constructed, reconstructed, enlarged or structurally altered except in full compliance with the terms and provisions of this section and any other applicable ordinances and regulations which apply to uses within the jurisdiction of this ordinance.

(e) The degree of flood protection sought by the provision of this section is considered reasonable for regulatory purposes and is based on acceptable engineering methods of study. Larger floods may occur on rare occasions. Flood heights may be increased by man-made or natural causes, such as ice jams and bridge openings restricted by debris. This section does not imply that districts outside the flood plain district, or that land uses permitted within such districts, will be free from flooding or flood damages.

Sec. 21-957. Definitions.

Base flood - The flood having a one percent chance of being equaled or exceeded in any given year.

Base flood elevation - The Federal Emergency Management Agency designated one hundred (100)-year water surface elevation.

Basement – Any area of the building having its floor sub-grade (below ground level) on all sides.

Development - Any man-made change to improved or unimproved real estate, including, but not limited to, buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.

Elevated building – A non-basement building built to have the lowest floor elevated above the ground level by means of fill, solid foundation perimeter walls, pilings, or columns (posts and piers).

Encroachment - The advance or infringement of uses, plant growth, fill, excavation, buildings, permanent structures or development into a floodplain, which may impede or alter the flow capacity of a floodplain.

Flood or Flooding shall mean:

- (1) A general or temporary condition of partial or complete inundation of normally dry land area from:
 - a. The overflow of inland or tidal waters; or
 - b. The unusual and rapid accumulation or runoff of surface waters from any source.
- (2) The collapse or subsistence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in paragraph 1 (a) of this definition.

Floodplain or flood-prone area - Any land area susceptible to being inundated by water from any source.

Floodway - The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

Historic structure - Any structure that is:

- (1) Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
- (2) Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;
- (3) Individually listed on a state inventory of historic places;
- (4) Individually listed on the City's Listing of Buildings 50 years old or older.

Lowest floor - The lowest floor of the lowest enclosed area (including basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; provided, that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of Federal Code 44CFR §60.3.

New Construction - For the purposes of determining insurance rates, structures for which the “start of construction” commenced on or after the effective date of an initial Flood Insurance Rate Map on or after December 31, 1974, whichever is later, and includes any subsequent improvements to such structures. For floodplain management purposes, new construction means structures for which start of construction commenced on or after the effective date of a floodplain management regulation adopted by a community and includes any subsequent improvements to such structures.

Shallow flooding area - A special flood hazard area with base flood depths from one to three feet where a clearly defined channel does not exist, where the path of flooding is unpredictable and indeterminate, and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.

Special flood hazard area - The land in the floodplain subject to a one (1%) percent or greater chance of being flooded in any given year.

Start of construction - The date the building permit was issued, provided the actual start of construction, repair, reconstruction, rehabilitation, addition, placement, substantial improvement or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For substantial improvement, the actual start of the construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

Substantial damage – Damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

Substantial improvement – Any restoration, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the *start of construction* of the improvement. This term includes structures which have incurred *substantial damage* regardless of the actual repair work performed. The term does not, however, include either:

- (1) Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions, or
- (2) Any alteration of a *historic structure* provided that the alteration will not preclude the structure's continued designation as a *historic structure*.

Watercourse - A lake, river, creek, stream, wash, channel, or other topographic feature on or over which waters flow at least periodically. Watercourse includes specifically designated areas in which substantial flood damage may occur.

Sec. 21-958. Floodplain districts.

(a) The floodplain districts shall include areas shall include special flood hazard areas. The basis for the delineation of these districts shall be the Flood Insurance Study (FIS) for the City of Williamsburg, Virginia, prepared by the Federal Emergency Management Agency, Federal Insurance Administration, as amended and new Floodplain new floodplain maps dated September 28, 2007, which shall be kept on file at the Williamsburg Planning Department.

(b) The Special Floodplain District shall be those areas identified as either an AE Zone or A1-30 Zone on the maps accompanying the Flood Insurance Study for which one hundred (100)-year flood elevations have been provided but for which no floodway has been delineated.

(c) The Approximated Floodplain District shall be those areas identified as an A Or A99 Zone on the maps accompanying the Flood Insurance Study. In these zones, no detailed flood profiles or elevations are provided, but the one hundred (100)-year floodplain boundary has been approximated.

(d) A 100-year floodplain boundary has been approximated. Such areas are shown as Zone A on the maps accompanying the Flood Insurance Study. For these areas, the 100-year flood elevations and floodway information from federal, state and other accepted sources shall be used, when available. Where the specific 100-year flood elevation cannot be determined for this area using other sources of data, such as the U. S. Army Corps of Engineers Floodplain Information Reports, U. S. Geological Survey Flood-Prone quadrangles, etc., then the applicant for the proposed use, development and/or activity shall determine this elevation in accordance with hydrologic and hydraulic engineering techniques. Hydrologic and hydraulic analyses shall be undertaken only by professional engineers or others of demonstrated qualifications, who shall certify that the technical methods used correctly reflect currently accepted technical concepts. Studies, analyses, computations, etc., shall be submitted in sufficient detail to allow a through review by the Williamsburg Planning Department and the City Engineer.

(e) The delineation of any of the Floodplain Districts may be revised by the City Council where natural or man-made changes have occurred and/or where more detailed studies have been conducted or undertaken by the U. S. Army Corps of Engineers or other qualified agency, or when an individual documents the need for such change. However, prior to any such change, approval must be obtained from the Federal Insurance Administration.

(f) Interpretations of the boundaries of the Floodplain Districts shall be made by the Zoning Administrator. Should a dispute arise concerning the boundaries, the Board of Zoning Appeals shall make the necessary determination in accordance with Article II, Division 5.

Sec. 21-959. Permits.

No specific permit shall be required by these regulations. An application for subdivision, site plan, rezoning, building permit, special use permit, sedimentation and erosion control permit, wetlands permit or other local development permit shall be considered an application for development under these regulations. The applicant shall be informed of the provisions of this article as they may apply to the property, and no permit shall be issued until the applicant has complied with such provisions.

Sec. 21-960. Permitted uses.

Permitted uses, special exception uses, special use permit uses, and accessory uses shall be established by the underlying zoning district.

Sec. 21-961. Design criteria.

(a) *In general.* All uses, activities and development occurring within any floodplain district shall be in accordance with the provisions of this section and with all other applicable codes and ordinances, such as the Virginia Uniform Statewide Building Code, the Subdivision Ordinance, and all other applicable state and federal laws. Under no circumstance shall any use, activity or development adversely affect the capacity of the channels or floodway of any watercourse, drainage ditch or any other drainage facility or system.

(b) *Alteration or relocation of watercourse.* Prior to any proposed alteration or relocation of any channels or of any watercourse, stream, etc., within the City a permit shall be obtained from the U. S. Corps of Engineers, the Virginia State Water Control Board, and the Virginia Marine Resources Commission. Furthermore, notification of the proposal shall be given by the applicant to all affected adjacent jurisdictions, the Division of Soil and Water Conservation and the Federal Insurance Administration.

(c) *Site plans, subdivisions and permit applications.* All applications for development in the floodplain districts, including site plans, subdivisions, and building permit applications, shall incorporate the following information, where applicable:

- (1) The 100-year flood boundary and the flood hazard zone classification, as shown on the FIRM, shall be shown on site plans, preliminary plats, development plans and final plats.
- (2) The elevation of the lowest floor (including basement).
- (3) For structures to be floodproofed (non-residential only), the elevation to which the structure will be floodproofed.

- (4) Topographic information showing existing and proposed ground elevation.
- (5) All subdivision proposals shall be consistent with the need to minimize flood damage.
- (6) All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage.
- (7) All subdivision proposals shall have adequate drainage provided to reduce exposure to flood hazards.
- (8) Base flood elevation data shall be provided for subdivision proposals and other proposed development proposals.

(d) *Encroachment provisions.* No new construction or development shall be permitted within the floodplain district unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the 100-year flood elevation more than one foot at any point.

(e) *Sanitary sewer facilities.* All new or replacement sanitary sewer facilities, including all pumping stations and collector systems, shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into the flood waters. In addition, they should be located and constructed to minimize or eliminate flood damage and impairment.

(f) *Water facilities.* All new or replacement water facilities shall be designed to minimize or eliminate infiltration of flood waters into the system and be located and constructed to minimize or eliminate flood damages.

(g) *Stormwater management facilities.* All stormwater management facilities shall be designed to convey the flow of surface waters without damage to persons or property. The systems shall ensure drainage away from buildings and onsite waste disposal sites. The facilities shall be designed to prevent the discharge of excess runoff onto adjacent properties.

(h) *Streets and sidewalks.* Streets and sidewalks should be designed to minimize their potential for increasing and aggravating the levels of flood flow. Drainage openings shall be required to sufficiently discharge flood flows without unduly increasing flood heights.

Sec. 21-962. Existing structures in floodplain districts.

(a) A structure or use of a structure or premises which lawfully existed before the enactment of these provisions, but which is not in conformity with these provisions may be continued subject to the following conditions:

- (1) Existing structures in the floodway area shall not be expanded or enlarged unless it has been demonstrated through hydrologic and hydraulic

analyses performed in accordance with standard engineering practice that the proposed expansion would not result in any increase in the 100-year flood elevation.

- (2) Any additions, modifications, alterations, repairs, reconstruction or improvements of any kind to an existing structure regardless of its location in a floodplain area must be built or brought up to code including elevation, venting, flood-resistant materials, etc. The substantial damage or improvement to any structure shall require the entire structure to be brought into full compliance with the provisions of this ordinance.

Sec. 21-963. Variances.

(a) A request for a variance to the requirements of this section shall be made in writing to the board of zoning appeals, in accordance with article II, division 5.

(b) The board of zoning appeals, in ruling on the request, shall consider the following factors:

- (1) The showing of good and sufficient cause.
- (2) The danger to life and property due to increased flood heights or velocities caused by encroachments. No variance shall be granted for any purposed use, development or activity within any Floodway District that will cause any increase in the 100-year flood elevation.
- (3) The danger that materials may be swept onto other lands or downstream to the injury of others.
- (4) The proposed water supply and sanitation systems and the ability of these systems to prevent disease, contamination and unsanitary conditions.
- (5) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owners.
- (6) The importance of the services provided by the proposed facility to the community.
- (7) The requirements of the facility for waterfront location.
- (8) The availability of alternative locations not subject to flooding for the proposed use.
- (9) The compatibility of the proposed use with existing development and development anticipated in the foreseeable future.
- (10) The relationship of the proposed use to the comprehensive plan and floodplain management program for the area.
- (11) The safety of access by ordinary and emergency vehicles to the property in time of flood.
- (12) The expected heights, velocity, duration, rate of rise and sediment transport of the flood waters expected at the site.
- (13) The repair or rehabilitation of historic structures upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as a historic structure and the variance is the

minimum necessary to preserve the historic character and design of the structure.

(14) Such other factors which are relevant to the purposes of this ordinance.

(c) The Board of zoning appeals may refer any application and accompanying documentation pertaining to any request for a variance to any engineer or other qualified person or agency for technical assistance in evaluating the proposed project in relation to flood heights and velocities, and the adequacy of the plans for flood protection and other related matters.

(d) Variances shall be approved only after the board of zoning appeals has determined that the granting of such will not result in unacceptable or prohibited increases in flood heights; additional threats to public safety, extraordinary public expense; and will not create nuisances, cause fraud or victimization of the public, or conflict with local laws or ordinances.

(e) Variances shall not be approved unless the board of zoning appeals has determined that the variance will be the minimum required to provide relief from any hardship to the applicant.

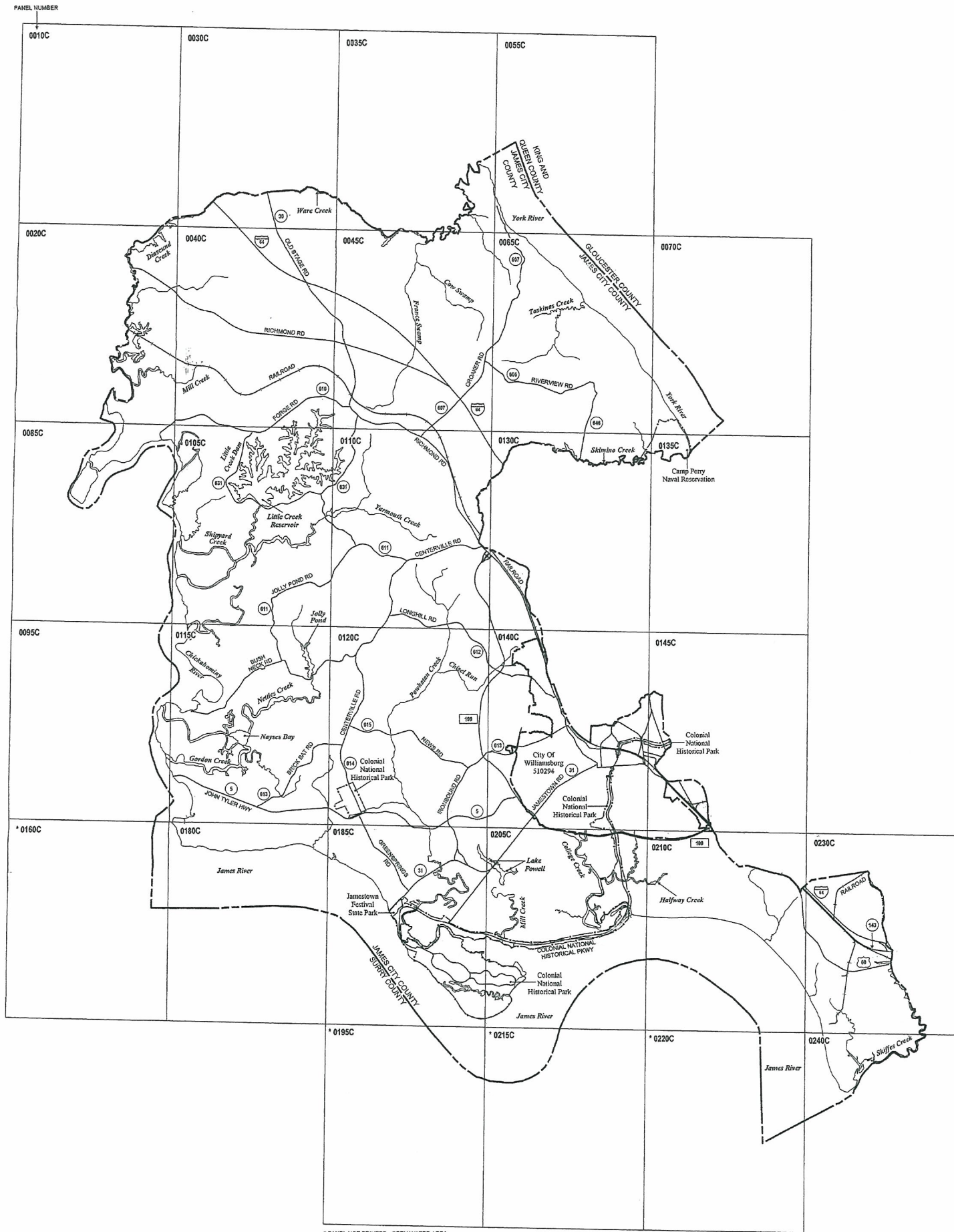
(f) The board of zoning appeals shall notify the applicant for a variance, in writing that the issuance of a variance to construct a structure below the 100-year flood elevation increases the risks to life and property and will result in increased premium rates for flood insurance. A record shall be maintained of this notification, as well as all variance actions, including justification for the issuance of the variance. Any variances which are issued shall be noted in the annual or biennial report submitted to the Federal Insurance Administrator.

This ordinance shall become effective on the tenth day following its passage.

Adopted: _____

Jeanne Zeidler, Mayor

Clerk of Council



LISTING OF COMMUNITIES					
COMMUNITY NAME	COMMUNITY NUMBER	LOCATED ON PANEL(S)	INITIAL NFIP MAP DATE	INITIAL FIRM DATE	MOST RECENT FIRM PANEL DATE
JAMES CITY COUNTY	510201	0010, 0020, 0030, 0035, 0040, 0045, 0055, 0065, 0070, 0085, 0095, 0105, 0110, 0115, 0120, 0130, 0135, 0140, 0145, 0160, 0165, 0195, 0205, 0210, 0215, 0220, 0230, 0240	JULY 18, 1976	FEBRUARY 05, 1991	
WILLIAMSBURG, CITY OF	510234	0140, 0145, 0205, 0210	MARCH 28, 1975	NOVEMBER 20, 1981	

*PANEL NOT PRINTED-OPEN WATER AREA

MAP REPOSITORIES

(Maps available for reference only, not for distribution.)

JAMES CITY COUNTY
(UNINCORPORATED AREAS):
Building E
Department of Code Compliance
101-E Mounts Bay Road
Williamsburg, Virginia 23187

WILLIAMSBURG, CITY OF:
Planning Department
401 Lafayette Street
Williamsburg, Virginia 23185

FIRM Panel Dates for Printed Panels of James City County, Virginia (All Jurisdictions)			
Panel	Effective Date	Panel	Effective Date
51095C0010C		51095C0115C	
51095C0020C		51095C0120C	
51095C0030C		51095C0130C	
51095C0035C		51095C0135C	
51095C0040C		51095C0140C	
51095C0045C		51095C0145C	
51095C0055C		51095C0180C	
51095C0065C		51095C0185C	
51095C0070C		51095C0205C	
51095C0085C		51095C0210C	
51095C0095C		51095C0215C	
51095C0105C		51095C0240C	
51095C0110C			

NOTE TO USERS

FEMA maintains information about map features, such as street locations and names, in or near designated flood hazard areas. Requests to revise information in or near designated flood hazard areas may be provided to FEMA during the community review period, at the final Consultation Coordination Officer's meeting, or during the statutory 90-day appeal period. Approved requests for changes will be shown on the final printed FIRM.

NOTE TO USER

Future revisions to this FIRM index will only be issued to communities that are located on FIRM panels being revised. This FIRM index therefore remains valid for FIRM panels dated [date] or earlier. Please refer to the "MOST RECENT FIRM PANEL DATE" column in the Listing of Communities table to determine the most recent FIRM index date for each community.

MAP DATES

This FIRM index displays the map date for each FIRM panel at the time that this index was printed. Because this index may not be distributed to unaffected communities in subsequent revisions, users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website at www.msc.fema.gov or by calling the Map Service Center at 1-800-358-9019.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be ordered directly from the Map Service Center at the number listed above.



NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
JAMES CITY COUNTY,
VIRGINIA
AND INCORPORATED AREAS
(SEE LISTING OF COMMUNITIES TABLE)

MAP INDEX
PANELS PRINTED: 10, 20, 30, 35, 40, 45,
55, 65, 70, 85, 95, 105, 110, 115, 120, 130, 135,
140, 145, 180, 185, 205, 210, 230, 240

PRELIMINARY
SEP 6 2008

MAP NUMBER
51095CIND0A

EFFECTIVE DATE

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodway data have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only to landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction, and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways are based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The projection used in the preparation of this map was Universal Transverse Mercator (UTM) zone 18. The horizontal datum was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1215 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles at a scale of 1:12,000 from photography dated 1994 or later.

Based on updated topographic information, this map reflects more detailed and up-to-date stream channel configurations and floodplain delineations than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the FEMA Map Service Center at 1-800-358-5616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-6620 and their website at <http://msc.fema.gov>.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/businessinfo>.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, AS, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A No Base Flood Elevations determined. Base Flood Elevations determined. Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AE Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently destroyed. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE ASR Area to be protected from 1% annual chance flood by a federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE S Areas determined to be outside the 0.2% annual chance floodplain. Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Base Flood Elevation line and value; elevation in feet* (EL 547)
- Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 1000-meter Universal Transverse Mercator grid values, zone 18
- 5000-foot grid ticks; Virginia State Plane coordinate system, South zone (FIPSZONE 4502), Transverse Mercator
- Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES

Refer to Map Repositories list on Map Index.

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP PANEL

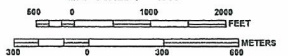
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



MAP SCALE 1" = 1000'



NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0140C

FIRM

FLOOD INSURANCE RATE MAP

JAMES CITY COUNTY, VIRGINIA

AND INCORPORATED AREAS

PANEL 140 OF 240

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
JAMES CITY COUNTY	510201	0140	C
WILLIAMSBURG, CITY OF	510204	0140	C

PRELIMINARY
SEP 9 2006

How to Use: The Map Number shown below should be used when placing map orders. The Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
51095C0140C

EFFECTIVE DATE

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction, and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The projection used in the preparation of this map was Universal Transverse Mercator (UTM) zone 18. The horizontal datum was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles at a scale of 1:12,000 from photography dated 1994 or later.

Based on updated topographic information, this map reflects more detailed and up-to-date stream channel configurations and floodplain delineations than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the FEMA Map Service Center at 1-800-358-6161 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and their website at <http://nfc.fema.gov>.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/businessinfo>.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAS) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A No Base Flood Elevations determined.
- ZONE AE Base Flood Elevations determined. Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AH Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decommissioned. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE
The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE D Areas determined to be outside the 0.2% annual chance floodplain. Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

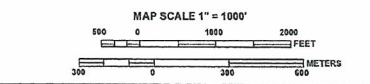
CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Base Flood Elevation line and value; elevation in feet
- Base Flood Elevation value where uniform within zone; elevation in feet
- *Referenced to the North American Vertical Datum of 1988
- Cross section line
- Transect line
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 1000-meter Universal Transverse Mercator grid values, zone 18
- 5000-foot grid ticks: Virginia State Plane coordinate system, South zone (FIPS ZONE 4502), Transverse Mercator
- Bench mark (see explanation in Notes to Users section of this FIRM panel)
- MLS River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index.
EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP PANEL
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0145C

FIRM
FLOOD INSURANCE RATE MAP
JAMES CITY COUNTY,
VIRGINIA
AND INCORPORATED AREAS

PANEL 145 OF 240
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:	COMMUNITY	NUMBER	PANEL	SUFFIX
	JAMES CITY COUNTY	510301	0145	C
	WILLIAMSBURG, CITY OF	510204	0145	C

PRELIMINARY
SEP 6 2005

Notice to User: The Map Number shown below should be used when placing map orders. The Community Number shown above should be used on insurance applications for the subject community.



MAP NUMBER
51095C0145C

EFFECTIVE DATE

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only to landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction, and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The projection used in the preparation of this map was Universal Transverse Mercator (UTM) zone 18. The horizontal datum was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles at a scale of 1:12,000 from photography dated 1994 or later.

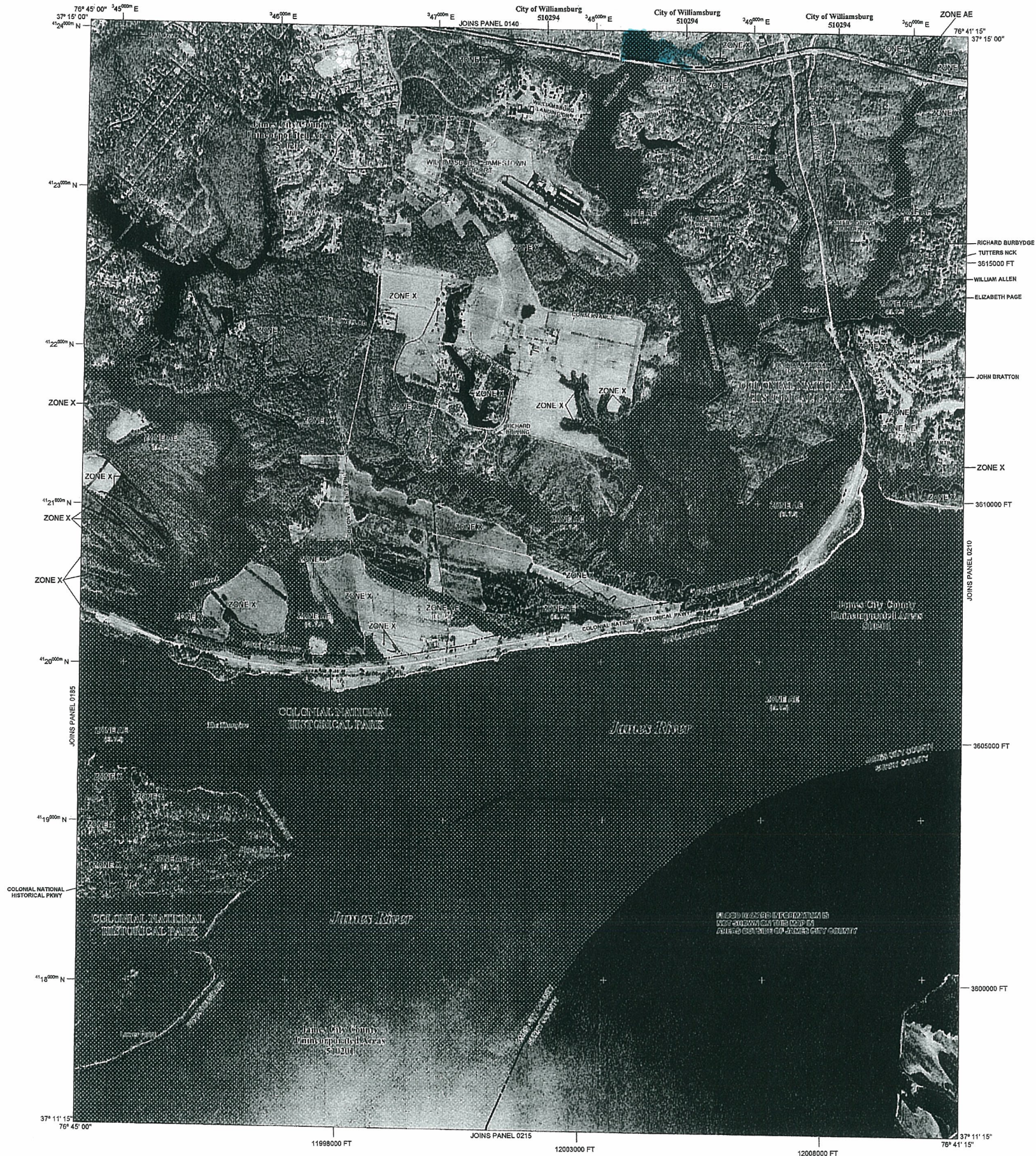
Based on updated topographic information, this map reflects more detailed and up-to-date stream channel configurations and floodplain delineations than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

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Contact the FEMA Map Service Center at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and their website at <http://msc.fema.gov>.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov/businessinfo>.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, APF, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial flat flooding, velocities also determined.
- ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decommissioned. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE APF** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations; flood depths or flood velocities.
- 5/3 Base Flood Elevation line and value; elevation in feet
- Base Flood Elevation value where uniform within zone; elevation in feet
- *referenced to the North American Vertical Datum of 1988
- Cross section line
- Transect line
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 1000-meter Universal Transverse Mercator grid values, zone 18
- 5000-foot grid ticks: Virginia State Plane coordinate system, South zone (FIPSZONE 4502), Transverse Mercator
- Bench mark (see explanation in Notes to Users section of this FIRM panel)
- *M.L.S. River Mile

MAP REPOSITORIES

Refer to Map Repositories list on Map Index.

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP PANEL

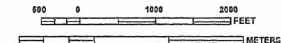
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.



MAP SCALE 1" = 1000'



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0205C

FIRM

FLOOD INSURANCE RATE MAP
JAMES CITY COUNTY,
VIRGINIA
AND INCORPORATED AREAS

PANEL 205 OF 240

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
JAMES CITY COUNTY	510291	205	C
WILLIAMSBURG, CITY OF	510294	205	C

PRELIMINARY
SEP 6 2008

Notes to Users: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.



MAP NUMBER
51095C0205C

EFFECTIVE DATE

Federal Emergency Management Agency

NOTES TO USERS

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National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

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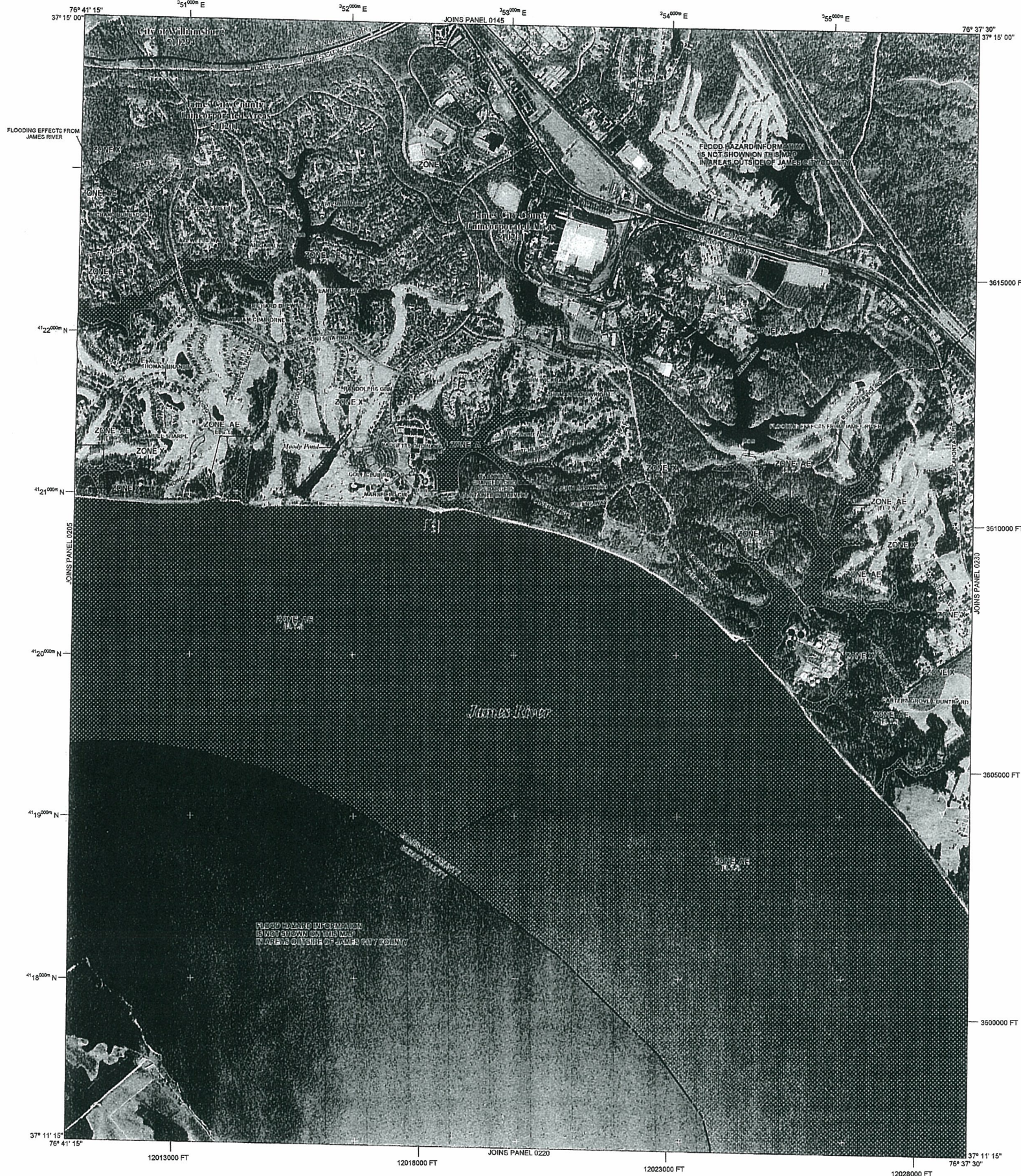
Based on updated topographic information, this map reflects more detailed and up-to-date stream channel configurations and floodplain delineations than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

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Contact the FEMA Map Service Center at 1-800-358-9516 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and their website at <http://mcs.fema.gov>.

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LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

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- ZONE A** No Base Flood Elevations determined.
ZONE AE Base Flood Elevations determined.
ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of sheet flow flooding, velocities also determined.
ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently abandoned. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE
The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS
ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
OTHER AREAS
ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)
CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
 0.2% annual chance floodplain boundary
 Floodway boundary
 Zone D boundary
 CBRS and OPA boundary
 Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
 Base Flood Elevation line and value; elevation in feet
 Base Flood Elevation value where uniform within zone; elevation in feet
 *Referenced to the North American Vertical Datum of 1988

Cross section line
 Transect line

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
 1000-meter Universal Transverse Mercator grid values, zone 18
 5000-foot grid ticks: Virginia State Plane coordinate system, South zone (FIPSZONE 4502), Transverse Mercator
 Bench mark (see explanation in Notes to Users section of this FIRM panel)
 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index.

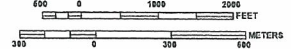
EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP PANEL
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-635-6620.



MAP SCALE 1" = 1000'



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0210C

FIRM

FLOOD INSURANCE RATE MAP
JAMES CITY COUNTY,
VIRGINIA
AND INCORPORATED AREAS

PANEL 210 OF 240

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:	COMMUNITY	NUMBER	PANEL	SUFFIX
	JAMES CITY COUNTY	510201	0210	C
	WILLIAMSBURG, CITY OF	510204	0210	C

PRELIMINARY
SEP 6 2006

Notice to User: The "Map Number" shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.



MAP NUMBER
51095C0210C

EFFECTIVE DATE

Federal Emergency Management Agency

FLOOD INSURANCE STUDY



Notice

This preliminary FIS report includes only revised Flood Profiles and Floodway Data tables. See "Notice to Flood Insurance Study Users" page for additional details.

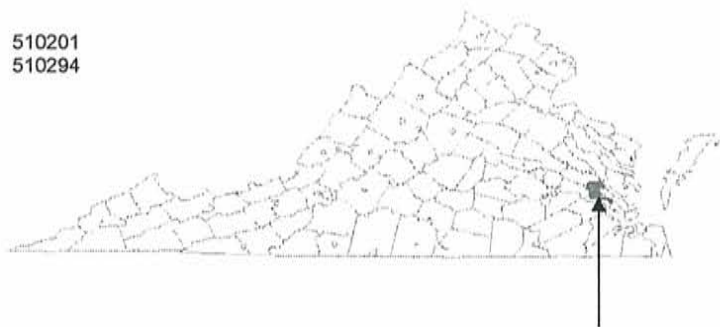
JAMES CITY COUNTY, VIRGINIA AND INCORPORATED AREAS

COMMUNITY NAME

JAMES CITY COUNTY
(UNINCORPORATED AREAS)
WILLIAMSBURG, CITY OF

COMMUNITY NUMBER

510201
510294



James City County

Effective:



Federal Emergency Management Agency

51095CV000A

**NOTICE TO
FLOOD INSURANCE STUDY USERS**

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) report may not contain all data available within the Community Map Repository. Please contact the Community Map Repository for any additional data.

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of this FIS report at any time. In addition, FEMA may revise part of this FIS report by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult with community officials and check the Community Map Repository to obtain the most current FIS report components.

Effective Date: _____

Revised Dates: _____

This preliminary FIS report does not include unrevised Floodway Data Tables or unrevised Flood Profiles. These Floodway Data Tables and Flood Profiles will appear in the final FIS report.

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FLOOD INSURANCE STUDY
JAMES CITY COUNTY AND INCORPORATED AREAS, VIRGINIA

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study (FIS) revises and updates information on the existence and severity of flood hazards in the geographic area of James City County, including the City of Williamsburg, Independent City, Virginia; and the unincorporated areas of James City County, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

The Digital Flood Insurance Rate Map (DFIRM) and FIS report for this countywide study have been produced in digital format. Flood hazard information was converted to meet the (FEMA) DFIRM database specifications and Geographic Information System (GIS) format requirements. The flood hazard information was created and is provided in a digital format so that it can be incorporated into a local GIS and be accessed more easily by the community.

GG3 produced a full digital conversion for James City County, Virginia. Base Map information such as the most up to date political boundaries, transportation lines, and water centerlines was obtained from the James City County GIS office. All other feature classes such as the BFEs (Base Flood Elevations), cross sections, flooding, and structures was fully digitalized and attributed from the effective FIRM (Flood Insurance Rate Map) panels.

1.2 Authority and Acknowledgments

The sources of authority for this FIS are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for the tidal flooding sources in James City County were performed by the Norfolk District of the U.S. Army Corps of Engineers (USACE) for the Federal Emergency Management Agency (FEMA), under Interagency Agreement No. EMW-87-E2509, Project Order No. 3, Amendment No. 1. This work was completed in September 1988. The hydrologic and hydraulic analyses for the riverine flooding sources presented in this study were prepared by the Soil Conservation Service during the preparation of a report entitled *Flood Hazard Analyses, Powhatan Creek and Tributaries*. This work was completed in December 1976.

In the City of Williamsburg, the hydrologic analysis for Queen Creek, an estuary to the York River; and College Creek, Paper Mill Creek and the outlet to Tutters Neck Pond, estuaries to the James River were obtained from the FISs for the unincorporated areas of James City County and York County (FEMA 1991 and FEMA 1988).

1.3 Coordination

The initial Consultation Coordination Office (CCO) meeting for James City County was held on June 17, 1986, and attended by representatives of FEMA, the county and the USACE (the study contractor). The purpose of an initial Consultation CCO meeting is to discuss the scope of the FIS.

Contacts with various Federal and State agencies were made during the preparation of the study in order to minimize possible hydrologic and hydraulic conflicts. A search for basic data was made at all levels of government.

The results of the study were reviewed at the final CCO meeting held on February 28, 1990, and attended by representatives of FEMA, the county and the study contractor to review the results of the study. The final meeting for the City of Williamsburg was held on April 5, 1993, with representatives of the City of Williamsburg, the USACE, Norfolk District and FEMA. All problems raised at these meetings have been addressed.

2.0 AREA STUDIED

2.1 Scope of Study

This FIS covers the geographic area of James City County, Virginia, including the incorporated community listed in Section 1.1. The areas studied by detailed methods were selected with priority given to all known flood hazards and areas of projected development or proposed construction through James City County.

The following riverine sources were studied by detailed methods within James City County: Powhatan Creek, for its entire length within the community; Long Hill Swamp, from its confluence with Powhatan Creek to a point approximately 1.1 miles upstream of State Route 612; West Tributary to Long Hill Swamp, from its confluence with Long Hill Swamp to a point approximately 1.3 miles upstream of State Route 612; East Tributary to Chisel Run, from its confluence with Chisel Run to a point approximately 0.4 mile upstream; and Chisel Run, from its confluence with Powhatan Creek to a point approximately 0.6 mile upstream of State Route 612. Tidal flooding from the York, James and Chickahominy Rivers and their adjoining estuaries was studied by detailed methods. All areas within the county affected by tidal flooding were included in the detailed study. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction.

The following flooding sources within the City of Williamsburg were studied by detailed methods: Queen Creek, an estuary to the York River; and College Creek, Paper Mill Creek and the outlet to Tutters Neck Pond, estuaries to the James River, were studied by detailed methods. Limits of detailed study are indicated on the FIRM (Exhibit 1).

Approximate analyses were used to study those areas having low development potential or minimal flood hazards. The scope and methods of study were proposed to and agreed upon by FEMA and James City County.

All or portions of the following flooding sources were studied by approximate methods: Barnes Swamp, Bird Swamp, Chisel Run, Diascund Creek Reservoir, Edwards Swamp, Little Creek Reservoir, Mill Creek, Richardson Mill Pond, Skiffles Creek Reservoir, Ware Creek, West Tributary to Long Hill Swamp, East Tributary to Chisel Run, Long Hill Swamp, Skimino Creek, Barlows Pond and an unnamed tributary to Chisel Run.

2.2 Community Description

James City County and the City of Williamsburg are located in southeastern Virginia. The county is bordered by the unincorporated areas of New Kent County to the north; the unincorporated areas of Gloucester County to the northeast; the unincorporated areas of Surry County to the south; the unincorporated areas of York County, the City of Williamsburg, and the City of Newport News to the east; and the unincorporated areas of Charles City County to the west. The following flooding sources also border the county: the York River to the east, the James River to the south and the Chickahominy River to the west. James City County encompasses an area of approximately 148 square miles, of which 34 square miles are water (Commonwealth of Virginia, 1974).

The population of James City County was 48,102, and 11,998 for the City of Williamsburg in 2000 (U.S. Census Bureau, 2005). Many residents are employed in the tourism and trade industries, stimulated by the many historical attractions in James City County. The floodplains of the county consist of scattered residential structures, businesses, croplands and forests. With the county's many miles of shoreline, increased pressure for development of the floodplains is expected.

The Powhatan Creek watershed comprises approximately 23 square miles of the Coastal Plain peninsula between the James and York Rivers in southeast Virginia. The James River is the southernmost basin of the Water Resources Council Mid-Atlantic Region. Powhatan Creek rises northwest of the City of Williamsburg and flows generally towards the south approximately 21 miles to its confluence with the James River. The main stem floodplain comprises approximately 2.2 square miles of predominately wooded swamp and tidal marsh. Tributary floodplains comprise another 0.47 square miles; these are also on relatively flat gradients. The upper perimeter of the watershed follows approximately along the 100-foot contour.

James City County and the City of Williamsburg both enjoy a temperate climate, with moderate seasonal changes characterized by warm summers and cool winters. In the warmest month, July, the average high temperature is 89 degrees Fahrenheit (°F) and the average low temperature is 67°F. In the coolest month, January, the average high temperature is 49°F and the average low temperature is 28°F. Annual precipitation over the area averages approximately 49 inches per year (The Weather Channel, 2005). There is some variation in the monthly averages; however, this rainfall is distributed uniformly throughout the year. Snowfall is infrequent, generally occurring in the light amounts and usually melting in a short period of time.

James City County is located in the Coastal Plain province between the York and James Rivers and is underlain primarily by clay, sand, marl and gravel strata. Elevations within the county range from sea level to approximately 140 feet.

2.3 Principal Flood Problems

Within the Powhatan Creek watershed, regularly spaced road fills act as dams and, in effect, convert portions of the floodplains into a series of floodwater-retarding reservoirs during the larger floods. Even moderate floods tend to cover the total floodplain in a network of shallow channels. Larger floods generally result in greater depths of flooding, with slight increases in the area inundated. Below State Route 31, approximately 3 miles upstream from the James River, tide stages rather than stream flows determine the maximum depth for a particular frequency.

The areas along the shoreline of James City County and the City of Williamsburg are vulnerable to tidal flooding from major storms, commonly referred to as

hurricanes and northeasters. Both storms produce winds that push large volumes of water against the shore.

Hurricanes, with their high winds and heavy rainfall, are the most severe storms to which the county is subjected. The term "hurricane" is applied to an intense cyclonic storm originating in tropical or subtropical latitudes in the Atlantic Ocean just north of the equator. While hurricanes may affect the area from May through November, nearly 80 percent occur during the months of August, September and October with approximately 40 percent occurring during September. The most severe hurricane to strike the county occurred in August 1933.

Another type of storm can cause severe damage to the county is the northeaster. This is also a cyclonic storm, and originates with little or no warning along the middle and northern Atlantic Coast. These storms occur most frequently in the winter months but may occur at any time. Accompanying winds are not of hurricane force, but are persistent, causing above-normal tides for long periods of time. The March 1962 northeaster was the most severe to ever hit the county.

The amount and extent of damage caused by any tidal flood will depend upon the topography of the area flooded, rate of rise in floodwaters, depth and duration of flooding, exposure to wave action, and the extent to which damageable property has been placed in the floodplain. The depth of flooding during these storms depends upon the velocity, direction and duration of the wind; the size and depth of the body of water over which the wind is acting and the astronomical tide. The duration of flooding depends upon the duration of the tide-producing forces. Floods caused by a hurricane are usually of a much shorter duration than the ones caused by a northeaster. Flooding from hurricanes rarely lasts more than one tidal cycle; however, flooding caused by northeasters may last several days, during which the most severe flooding takes place at the time of the peak astronomical tide.

The timing or coincidence of the maximum storm surge with the normal high tide is an important factor in the consideration of flooding from tidal sources. The mean range of tide in the York River at West Point is 2.8 feet; mean range of tide is 2 feet in the James River at Jamestown Island. The range of tide may be somewhat less in the connecting bays and inlets (U.S. Department of Commerce, 1987).

The area also contains estuaries of the York, James and Chickahominy Rivers that are subject to tidal flooding in their lower reaches but fluvial flooding on the upper reaches. Flooding on the upper reaches of these streams may be caused by heavy rains occurring at any time during the year. Flooding may also occur as a result of intense rainfall produced by local thunderstorms or tropical disturbances such as hurricanes, which move into the area from the Gulf or Atlantic coasts.

James City County has experienced major storms since the early settlement of the area. Historical accounts of severe storms in the area date back several hundred years. The following paragraphs discuss some of the large storms that have occurred in recent history.

The hurricane of August 23, 1933 was one of the most severe storms that ever occurred in the Middle Atlantic region. This tropical hurricane passed inland near Cape Hatteras on August 22, passed slightly west of Norfolk and continued towards the north accompanied by extreme high wind and tide. The storm surge in the bay and tidal estuaries were the highest of record and coincided with astronomical high tide, The water level reached a maximum of 8 feet in Hampton Roads (USACE, 1962).

Hurricane "Hazel," the second most destructive of recent hurricanes to strike the area, entered the mainland south of Wilmington, North Carolina, during the morning of October 15, 1954, and moved rapidly northward, passing over Norfolk and Fredericksburg in the early afternoon. The winds were from the east and southeast until the eye passed. When the eye passed, the winds shifted to the southwest with higher velocities. The hurricane surge was not as high as the August 1933 storm, although the tidal surge was superimposed on the normal high tide. In addition to the damage by tidal flooding, much damage was caused to roofs, communication lines and other structures by high wind. Damage of this nature is characteristic of that to be expected during hurricanes (USACE, 1962).

The most recent flood of major proportions in the area occurred during the northeaster of March 6 to 8, 1962. Disastrous flooding and high waves occurred along the Atlantic seaboard from New York to Florida. This flood was unusual, even for a northeaster, since it was caused by a low pressure cell that moved from south to north past Hampton Roads and then reversed its course, moving again to the south and bringing huge volumes of water and high waves. The maximum flood height occurred on the morning of March 7 and reached 7.4 feet in Hampton Roads (USACE, 1962).

2.4 Flood Protection Measures

There are no existing flood control structures that would provide protection during major floods in James City County or the City of Williamsburg. There are several measures that have provided some protection against flooding. These include bulkheads, seawalls, jetties and nonstructural measures for floodplain management, such as zoning codes. The "Uniform Statewide Building Code," which went into effect in September 1973, states, "where a structure is located in a 100-year floodplain" the lowest floor of all future construction or substantial improvement to an existing structure...must be built at or above that level, except for nonresidential structures which may be floodproofed to that level" (Commonwealth of Virginia, 1973).

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 1-percent-annual-chance (100-year) flood in any 50-year period is approximately 40 percent (4 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by detailed methods affecting the community.

Hydrologic analyses for Powhatan Creek, Long Hill Swamp, Chisel Run, West Tributary to Long Hill Swamp and East Tributary to Chisel Run were taken from a report entitled *Flood Hazard Analysis, Powhatan Creek and Tributaries*, prepared by the SCS (U.S. Department of Agriculture, 1976).

Peak discharge-drainage area relationships for James City County are shown in Table 1.

Table 1 - Summary of Discharges

<u>Flooding Source and Location</u>	<u>Drainage Area (square miles)</u>	<u>Peak Discharges (cubic feet per second)</u>			
		<u>10-Percent- Annual-Chance</u>	<u>2-Percent- Annual-Chance</u>	<u>1-Percent- Annual-Chance</u>	<u>0.2-Percent- Annual-Chance</u>
POWHATAN CREEK At State Route 5	*	2,262	3,647	4,255	5,784
LONG HILL SWAMP A point approximately 2,500 feet upstream of confluence with Powhatan Creek	*	970	1,567	1,835	2,522
CHISEL RUN A point approximately 500 feet upstream of confluence with	*	788	1,240	1,434	1,903

Powhatan Creek

WEST TRIBUTARY TO LONG HILL SWAMP At downstream side of State Route 612 bridge	*	413	674	787	1,073
EAST TRIBUTARY TO CHISEL RUN A point approximately 1,100 feet upstream of confluence with Chisel Run	*	251	375	430	562

*Data not available

Tide records for James City County and the City of Williamsburg are limited and by themselves are inadequate to establish a tide-frequency relationship. However, mean tide levels at several locations in the county and limited high-water data at West Point on the York River were correlated with mean tide levels and tide-frequency curves developed for both the Norfolk Harbor gage and the Gloucester Point gage. The Norfolk Harbor gage is located approximately 10 miles inside the Chesapeake Bay, while the Gloucester Point gage is located near the mouth of the York River. Historical accounts of tidal flooding are available for nearly 300 years, but a reasonably accurate indication of the heights reached in Norfolk Harbor is available only since 1908 and a complete record since 1928. The Gloucester Point gage was established in 1950.

The adopted tide-frequency curve for the York River and its estuaries in James City County is based on the Norfolk Harbor gage. To develop the tidal frequencies for the Norfolk Harbor, a statistical analysis was performed in accordance with procedures outlined in U.S. Geological Survey (USGS) Bulletin 17B (USGS, 1981). The Pearson Type III methodology, without the logs, was incorporated for the selected period of record, 1928 through 1978. Consideration was given to separating hurricane and non-hurricane events. Although objective statistical approaches are available for incomplete samples (a hurricane-related tide exists for less than 50 percent of the years on record), they do not always provide reasonable results. Therefore, all tropical and extratropical events were included together in the analysis of the annual maximum tides.

The analysis of the 51 years of systematic record indicated that the 1933 and 1936 events could be high outliers. However, assuming that the true distribution is defined by the computed (non-adjusted) statistics, the estimated recurrence interval for the 1933 event is 10 years. It has been determined that, with 51 years of record, the probability of an event of this magnitude being exceeded is 40 percent. Since the risk is so high and it is known that several events as large if not larger than the 1933 event have historically occurred, the 1933 event (and any less severe events) was not considered to be a high outlier.

Historical accounts indicate that tides have occurred in Norfolk Harbor at approximately 8 feet in 1667 and 1785 and approximately 7.9 feet in 1846. There has been a gradual rise in sea level over the investigated period of record at Norfolk Harbor. There was some question as to the amount of adjustment that should be made to the historic events. To avoid overestimating the impact of sea level rise, the historic events were increased by only 0.5 foot (approximately the same adjustment for the 1924 to 1942 period). The analysis based on a historical period of 312 years resulted in a slight move to the left of the upper portion of the frequency curve when compared to the systematic record. Since the adjustment was not very large and there is some question as to the reliability of the historical data, the computed statistics based on the 51 years of systematic record were adopted.

The lower portion of the statistical curve was adjusted with a partial duration analysis using plotting positions in accordance with Weibul (USGS, 1981). It included all elevations above 4.26 feet.

Tidal flood-frequency elevations used in this study for the James and Chickahominy Rivers and their estuaries were taken from the Flood Insurance Study for the City of Norfolk (FEMA, 1984).

The Stillwater elevation for the 10-, 50-, 100-and 500-year floods have been determined for the York, James, and Chickahominy Rivers are summarized in Table 2, "Summary of Stillwater Elevations."

Table 2 - Summary of Stillwater Elevations

<u>Flooding Source and Location</u>	<u>Elevation (feet NAVD88)</u>			
	<u>10-Percent- Annual-Chance</u>	<u>2-Percent-Annual- Chance</u>	<u>1-Percent- Annual-Chance</u>	<u>0.2-Percent- Annual-Chance</u>
YORK RIVER AND ESTUARIES				
Shoreline from confluence of Skimino Creek to confluence of Ware Creek	4.0	5.5	6.3	8.3
Shoreline along Ware Creek	5.0	6.4	7.0	8.4
JAMES RIVER AND ESTUARIES				
Entire shoreline within community	5.4	6.8	7.5	8.8
CHICKAHOMINY RIVER AND ESTUARIES				
Entire shoreline within community	5.4	6.8	7.5	8.8

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the Flood Insurance Rate Map (FIRM) represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data Table in the FIS report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS report in conjunction with the data shown on the FIRM.

Hydraulic analyses for Powhatan Creek, Long Hill Swamp, Chisel Run, West Tributary to Long Hill Swamp and East Tributary to Chisel Run were taken from a report entitled *Flood Hazard Analysis, Powhatan Creek and Tributaries*, prepared by the SCS (U.S. Department of Agriculture, 1976).

Cross section data for the backwater analyses were obtained by either field survey for from topographic maps furnished by James City County. Only limited surveys were conducted to determine elevations and dimensions of bridge openings, culverts and channels.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the Flood Insurance Rate Map (Exhibit 2).

Channel roughness factors (Manning's "n") used in the hydraulic computations were assigned on the basis of land use conditions of the drainage area.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the Flood Profiles (Exhibit 1) are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

Hydraulic analyses, considering storm characteristics and the shoreline and bathymetric characteristics of the flooding sources studied, were carried out to provide estimates of the elevations of floods of the selected recurrence intervals along each of the shorelines.

Special consideration was given to the vulnerability of James City County to wave attack along shorelines of the York and James Rivers during severe hurricanes and northeasters. Areas of shoreline subjected to significant wave

attack are referred to as coastal high hazard zones. Methods have been developed to determine which sections of a shoreline fall into this category (USGS). The factors considered for such a determination include: choice of a suitable fetch, its length and width, sustained wind velocities, coastal water depths and physical features of the shoreline that would appreciably affect wave propagation. All of these factors are analyzed to determine if a wave with a height of 3 feet could be generated. The 3 foot wave has been determined to be the minimum size wave capable of causing major damage to conventional wood frame or brick veneer structures. This criterion has been adopted by FEMA for the determination of V zones. Based on the above criteria, the shoreline of James City County is not exposed to severe wave attack and has not been designated as part of a coastal high hazard zone.

3.3 Vertical Datum

All FIS reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FIS reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD29). With the finalization of the North American Vertical Datum of 1988 (NAVD88), many FIS reports and FIRMs are being prepared using NAVD88 as the referenced vertical datum.

All flood elevations shown in this FIS report and on the FIRM are referenced to NAVD88. Effective information was converted from NGVD29 to NAVD88. The average conversion factor of -0.978 feet was applied to convert all effective Base Flood Elevations (BFEs). Structure and ground elevations in the community must, therefore, be referenced to NAVD88. It is important to note that adjacent communities may be referenced to NGVD29. This may result in differences in BFEs across the corporate limits between the communities.

For more information on NAVD88, see the FEMA publication entitled *Converting the National Flood Insurance Program to the North American Vertical Datum of 1988* (FEMA, June 1992), or contact the Vertical Network Branch, National Geodetic Survey, Coast and Geodetic Survey, National Oceanic and Atmospheric Administration, Silver Spring, Maryland, 20910 (Internet address <http://www.ngs.noaa.gov>).

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the Technical Support Data Notebook associated with the FIS report and FIRM for this community. Interested individuals may contact FEMA to access these data.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each FIS provides 1-percent-annual-chance flood elevations and delineations of the 1- and 0.2-percent-annual-chance floodplain boundaries and 1-percent-annual-chance floodway to assist communities in developing floodplain management measures. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles, Floodway Data Table, and Summary of Stillwater Elevations Table. Users should reference the data presented in the FIS report as well as additional information that may be available at the local map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual-chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance flood is employed to indicate additional areas of flood risk in the community. For each stream studied by detailed methods, the 1- and 0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps. For the tidal flooding sources studied in detail, the 1- and 0.2-percent-annual-chance floodplain boundaries have been delineated using topographic maps at scales of 1:24,000 and 1"=200' with contour intervals of 5 and 10 feet (USGS and James City County, 1988).

The 1- and 0.2-percent-annual-chance floodplain boundaries are shown on the FIRM (Exhibit 2). On this map, the 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM (Exhibit 2).

4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in

areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent-annual-chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this FIS report and on the FIS were computed for certain stream segments on the basis of equal-conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations have been tabulated for selected cross sections (Table 3). In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the floodway boundary has been shown.

Floodway data shown in Table 3 were taken from a report entitled *Flood Hazard Analyses, Powhatan Creek and Tributaries* (Commonwealth of Virginia, 1973). Information shown in Table 3 represents all available floodway data contained in the above-mentioned report; due to the scope of this study, no additional floodway data were calculated for the streams studied by detailed methods.

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
POWHATAN CREEK								
A	19,250 ¹	1,080	*	*	9.6	9.6	*	*
B	25,000 ¹	331	*	*	12.4	12.4	*	*
C	25,080 ¹	943	*	*	16.2	16.2	*	*
D	28,630 ¹	957	*	*	16.6	16.6	*	*
E	34,800 ¹	487	*	*	18.9	18.9	*	*
F	39,780 ¹	520	*	*	22.0	22.0	*	*
G	39,900 ¹	564	*	*	24.2	24.2	*	*
H	44,530 ¹	923	*	*	24.9	24.9	*	*
I	48,340 ¹	844	*	*	25.7	25.7	*	*
J	50,760 ¹	338	*	*	29.2	29.2	*	*
LONG HILL SWAMP								
A	2,430 ²	209	*	*	31.7	31.7	*	*
B	4,400 ²	311	*	*	33.9	33.9	*	*
C	6,460 ²	287	*	*	37.1	37.1	*	*
D	6,580 ²	536	*	*	44.0	44.0	*	*
E	8,080 ²	180	*	*	44.3	44.3	*	*
F	10,390 ²	120	*	*	46.6	46.6	*	*
G	12,670 ²	131	*	*	51.7	51.7	*	*

¹Feet above confluence with James River

²Feet above confluence with Powhatan Creek

*Data not available

FEDERAL EMERGENCY MANAGEMENT AGENCY

FLOODWAY DATA

TABLE 3

JAMES CITY COUNTY, VA
AND INCORPORATED AREAS

POWHATAN CREEK / LONG HILL SWAMP

The area between the floodway and 1-percent-annual-chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water surface elevation of the 1-percent-annual-chance flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1.

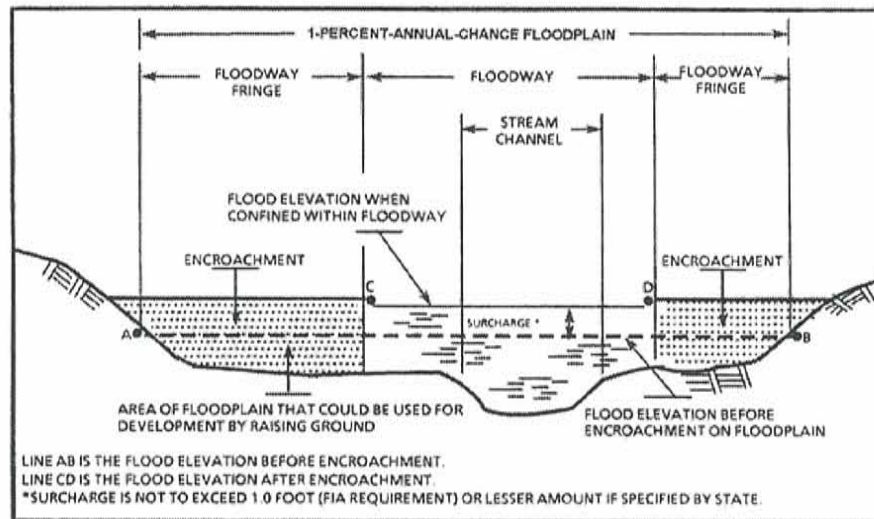


Figure 1 - Floodway Schematic

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no BFE (1-percent-annual-chance) or base flood depths are shown within this zone.

Zone AE

Zone AE is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by detailed methods. In most instances, whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance risk zone that corresponds to the areas of 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance risk zone that corresponds to the areas of 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot base flood depths derived from the detailed hydraulic analyses are shown within this zone.

Zone AR

Zone AR is the flood insurance risk zone that corresponds to an area of special flood hazard formerly protected from the 1-percent-annual-chance flood event by a flood-control system that was subsequently decertified. Zone AR indicates that the former flood-control system is being restored to provide protection from the 1-percent-annual-chance or greater flood event.

Zone A99

Zone A99 is the flood insurance risk zone that corresponds to areas of the 1-percent-annual-chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No BFEs or depths are shown within this zone.

Zone V

Zone V is the flood insurance risk zone that corresponds to the 1-percent-annual-chance coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are performed for such areas, no BFEs are shown within this zone.

Zone VE

Zone VE is the flood insurance risk zone that corresponds to the 1-percent-annual-chance coastal floodplains that have additional hazards associated with storm waves. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance risk zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by levees. No BFEs or base flood depths are shown within this zone.

Zone X (Future Base Flood)

Zone X (Future Base Flood) is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined based on future-conditions hydrology. No BFEs or base flood depths are shown within this zone.

Zone D

Zone D is the flood insurance risk zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 **FLOOD INSURANCE RATE MAP**

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance risk zones as described in Section 5.0 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent-annual-chance floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

7.0 OTHER STUDIES

This report either supersedes or is compatible with all previous studies on streams studied in this report and should be considered authoritative for purposes of the NFIP.

Flood Insurance Studies have been prepared for the unincorporated areas of New Kent County, the unincorporated areas of Surry County, the unincorporated areas of Charles City County, the unincorporated areas of York County, the unincorporated areas of Gloucester County and the City of Newport News (FEMA, 1990; FEMA, 1990; FEMA, 1990; FEMA 1988; FEMA, 1987; FEMA 1986). The results of this study are in complete agreement with the results of those studies.

A report entitled *Flood Hazard Analysis, Powhatan Creek and Tributaries* has been prepared by the Soil Conservation Service (U.S. Department of Agriculture, 1976). The results of this study are in complete agreement with the results of that study.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting FEMA, Federal Insurance and Mitigation Division, Federal Regional Center, 615 Chestnut Street, Philadelphia, PA, 19106.

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE	FIRM EFFECTIVE DATE	FIRM REVISION DATE
JAMES CITY COUNTY CITY OF WILLIAMSBURG	July 18, 1975 March 28, 1975	September 24, 1982 None	February 6, 1991 November 20, 1981	March 2, 1994

FEDERAL EMERGENCY MANAGEMENT AGENCY
JAMES CITY COUNTY, VA
AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

TABLE 4

9.0 BIBLIOGRAPHY AND REFERENCES

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<http://www.weather.com/activities/other/other/weather/climo-monthly-graph.html?locid=USVA0832&from=search>, Accessed 26 January 2005.

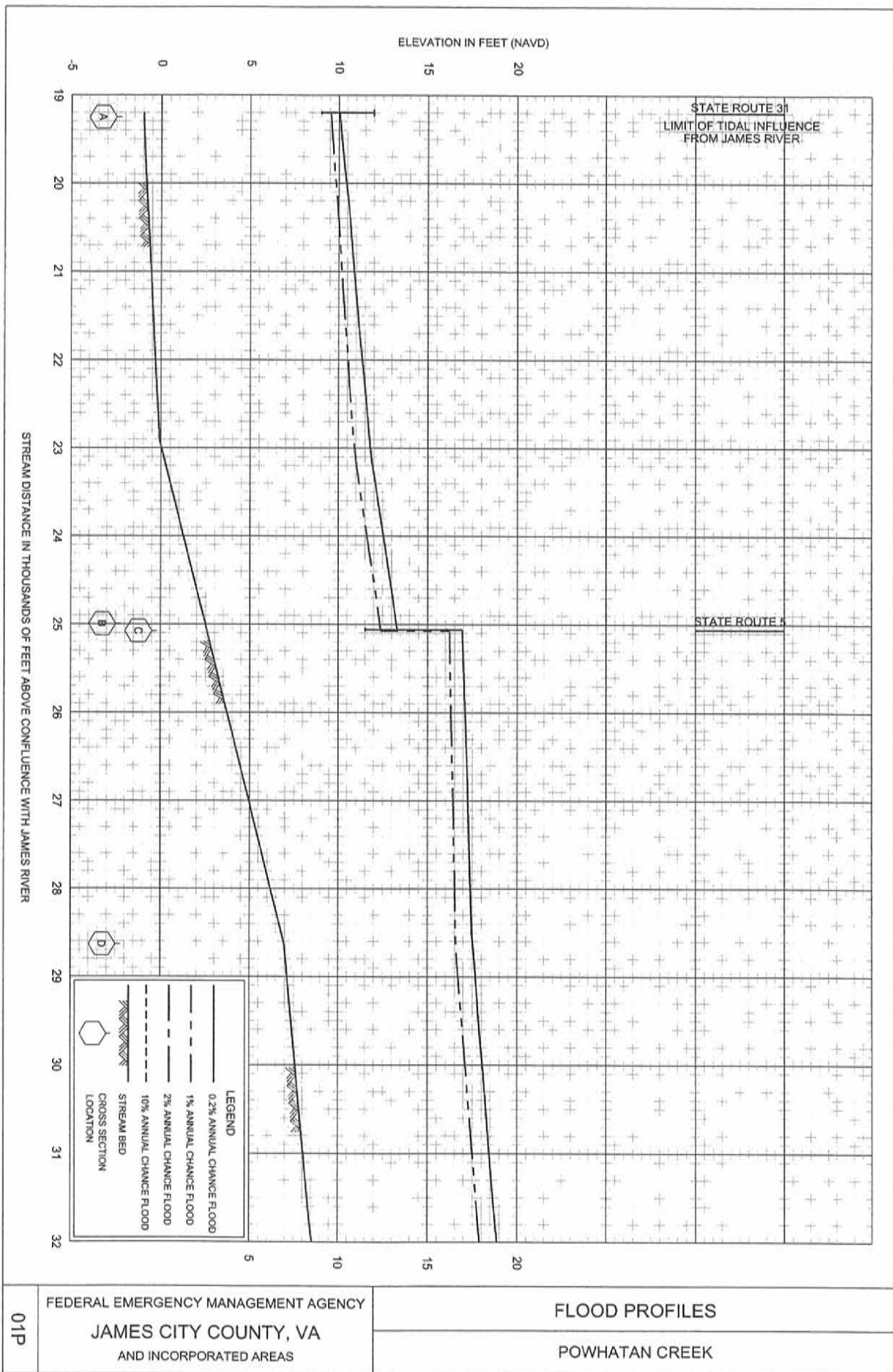
10.0 REVISIONS DESCRIPTION

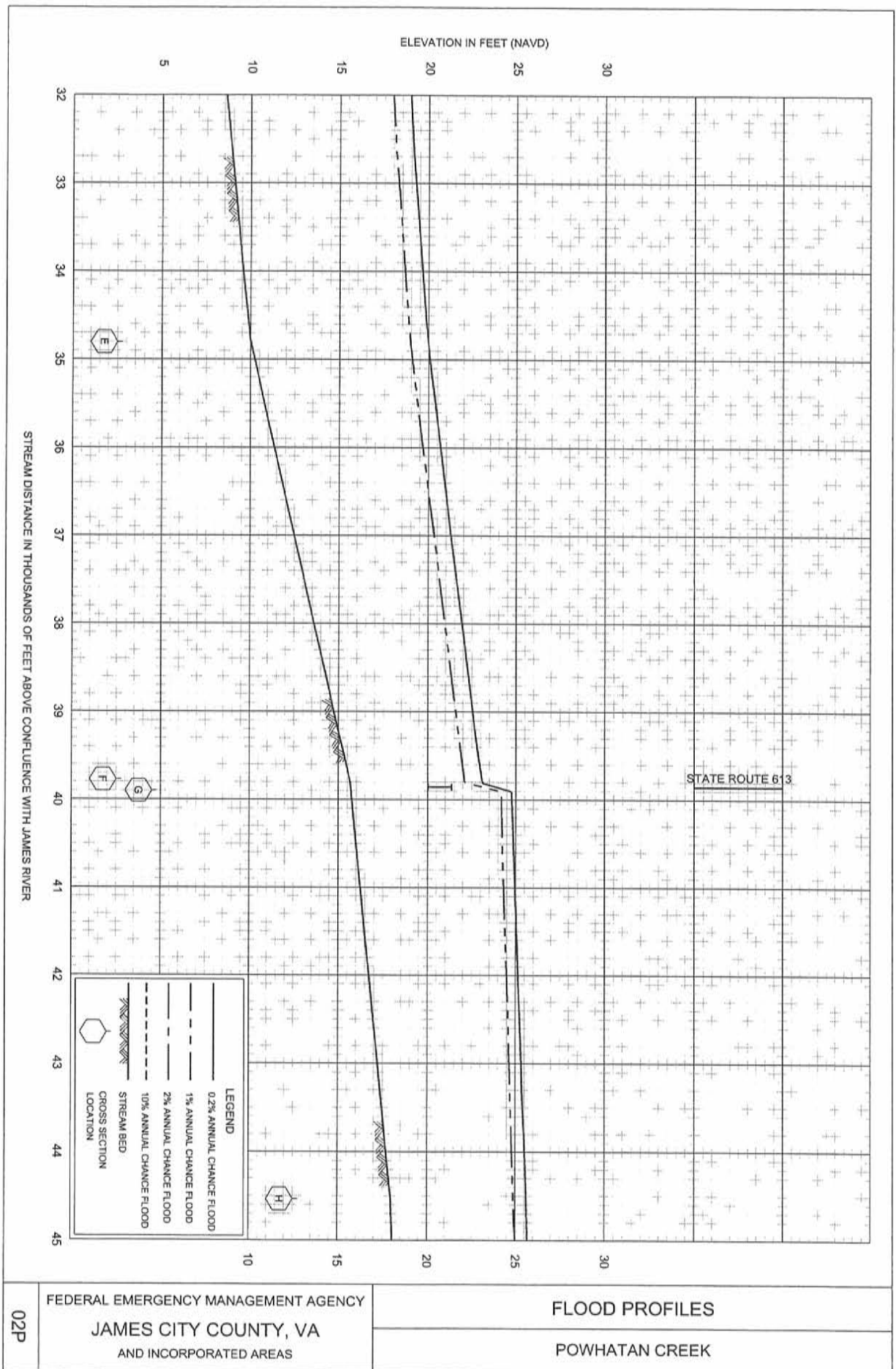
This section has been added to provide information regarding significant revisions made since the original FIS and FIRM were printed. Future revisions may be made that do not result in the republishing of the FIS report. All users are advised to contact the Community Map Repository at the address below to obtain the most up-to-date flood hazard data.

Building E. Department of Code Compliance
101 East Mounts Bay Road
Williamsburg, VA 23187

10.1 First Revision

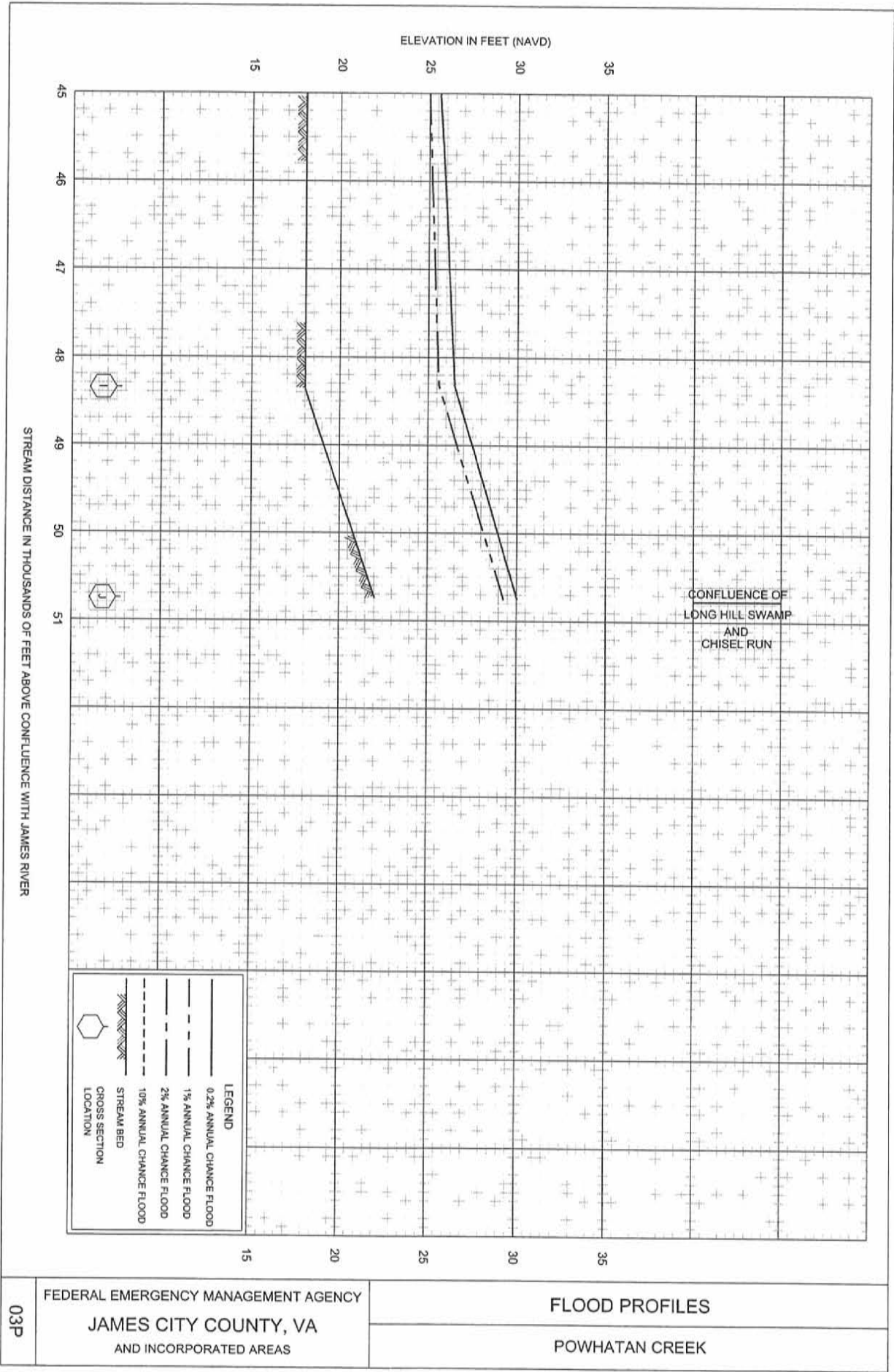
The March 2, 1994 revision for the City of Williamsburg updated the corporate limits, added base flood elevations to change special flood hazard areas, changed zone designations, update map format and add special flood hazard areas previously shown on the Unincorporated Areas of James City County, Virginia Flood Insurance Rate Map dated February 6, 1991.

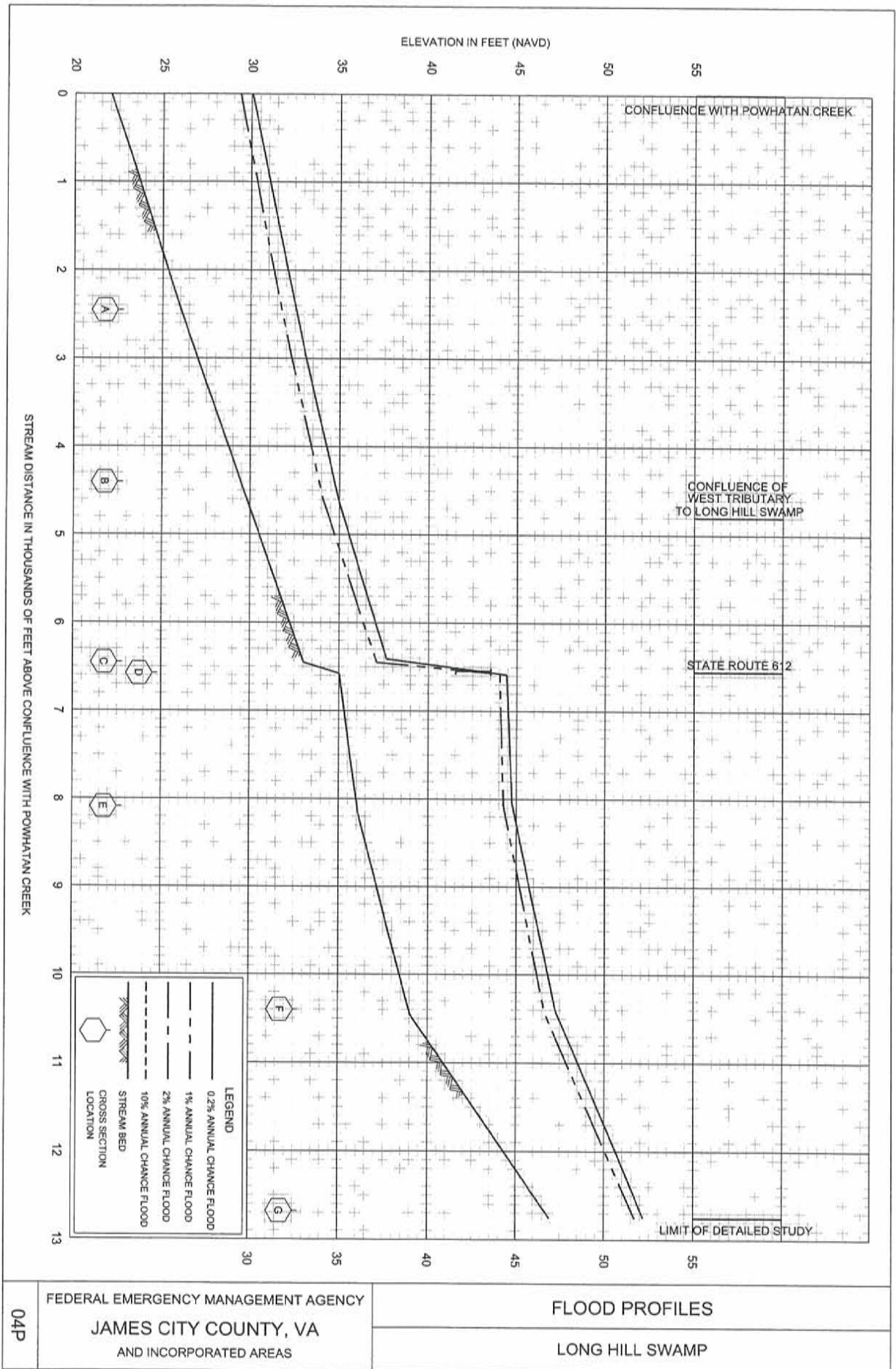


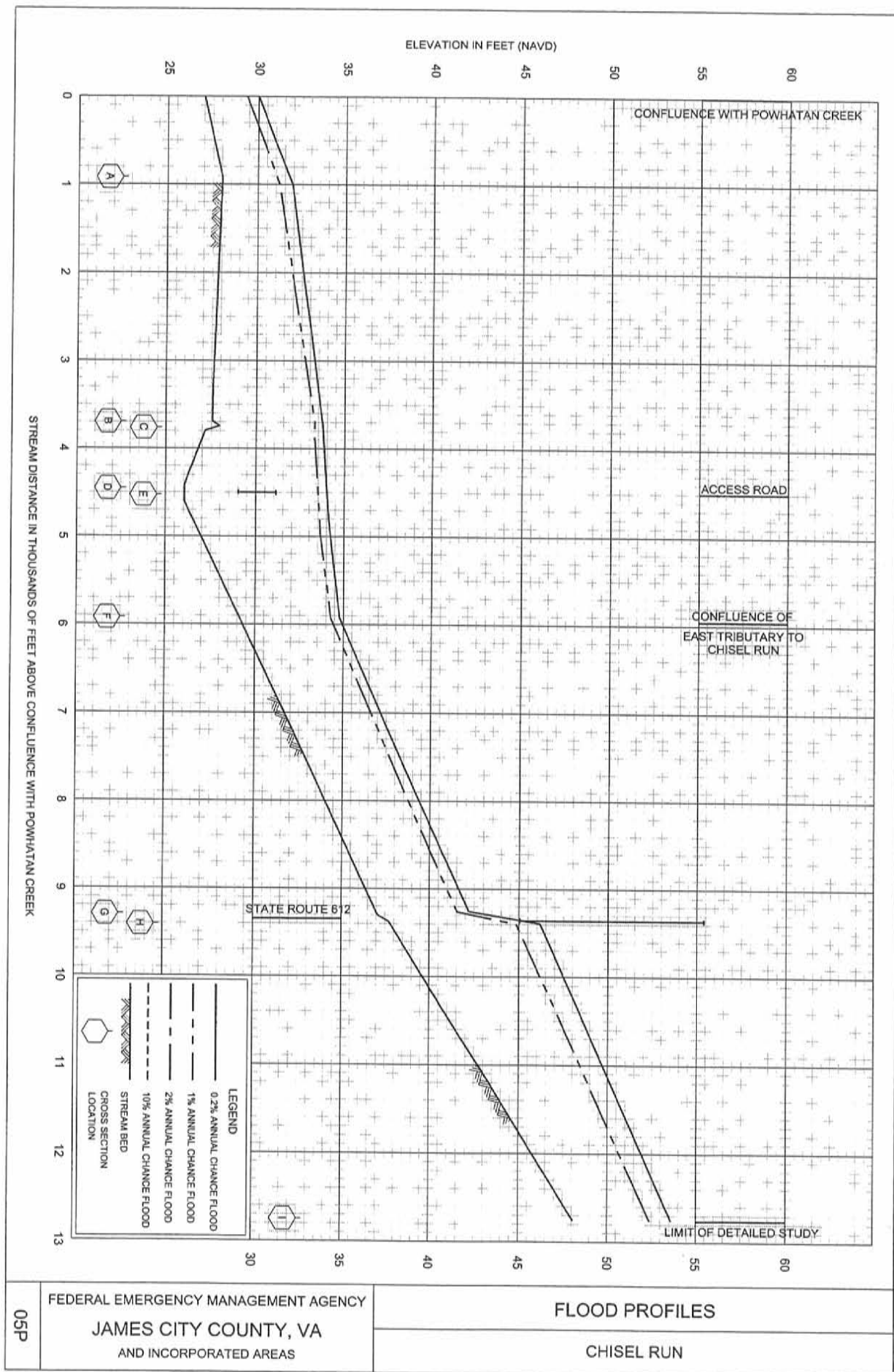


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FLOOD PROFILES
POWHATAN CREEK







05P

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FLOOD PROFILES

CHISEL RUN

